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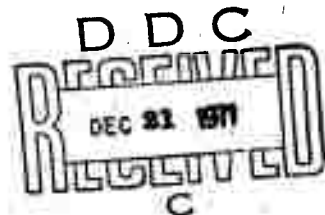
ANNUAL HISTORICAL SUMMARY

DEFENSE DOCUMENTATION CENTER

1 JULY 1970 THROUGH 30 JUNE 1971



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13. ABSTRACT

This document highlights the more significant activities of the Defense Documentation Center in its role of scientific, technical, and management information transfer from the information sources to the user communities. While emphasis is given to accomplishments in FY 1971, prior achievements as well as future plans are discussed to provide an overall view.

The mission of the Center is described in the document, and is summarized here as: (1) acquiring, storing, and making available all types of R&D reports produced or sponsored by U.S. military organizations; (2) operating a variety of central Department of Defense computer-based data banks of technical and management information; and (3) executing an aggressive development program to introduce new or improved systems and techniques related to information transfer.

Activities and accomplishments during the year include those in the areas of: (1) technical report services, (2) research and engineering management information services, (3) on-line retrieval, (4) selective documentation services, (5) specialized data banks, (6) microphotograph, (7) language and indexing, (8) automatic data processing, and (9) supporting customer relations and management functions.

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| | * Defense Documentation Center | | | | | | |
| | Management Engineering | | | | | | |
| | Armed Forces Research | | | | | | |
| | Data Processing Systems | | | | | | |
| | Data Storage Systems | | | | | | |
| | On-Line Systems | | | | | | |
| | Work Unit Information System | | | | | | |
| | Announcement Bulletins | | | | | | |
| | Reports | | | | | | |
| | Bibliographies | | | | | | |
| | Microphotography | | | | | | |
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FOREWORD

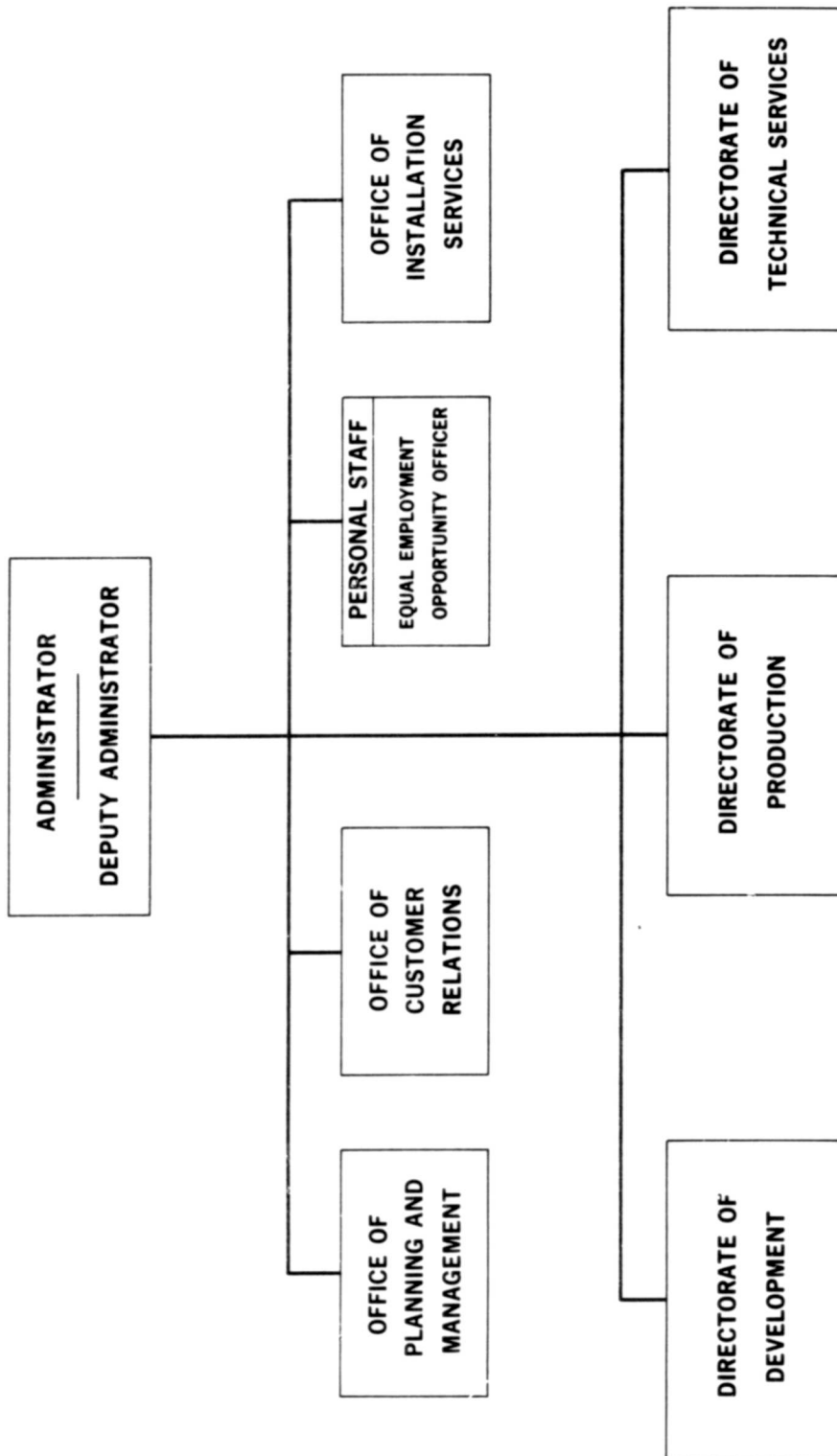
This summary describes the more significant activities and achievements of the Defense Documentation Center during fiscal year 1971 (1 July 1970 through 30 June 1971). It was compiled and published in compliance with DSA Regulation Number 3399.1, Historical Activities.

Robert B. Stegmaier Jr.
ROBERT B. STEGMAIER, JR.
Administrator

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DEFENSE DOCUMENTATION CENTER



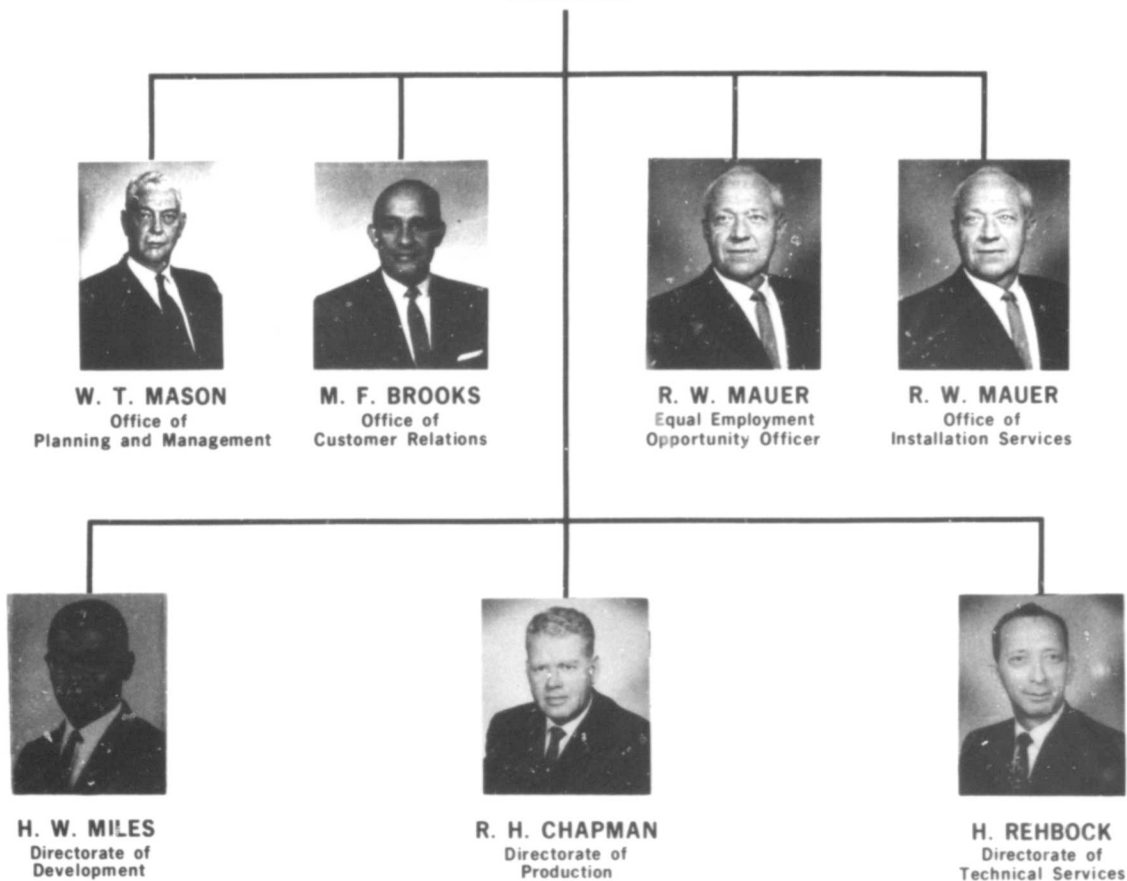
Note: In consonance with Servicing Arrangements agreed upon by HQ DSA, DDC, and DSASC, the Chiefs of the DSASC Civilian Personnel Division and the Office of Security Support report to the Administrator, DDC, in their areas of functional cognizance, and provide operational support.

Approved by: *Robert B. Stegmüller, Jr.*
 ROBERT B. STEGMÜLLER, JR.
 Administrator
 Date: 15 October 1970
 Prepared by: Office of Planning and Management

KEY PERSONNEL
DEFENSE DOCUMENTATION CENTER



Dr. R. B. STEGMAIER, Jr.
Administrator



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I. DDC AND THE SCIENTIFIC AND TECHNICAL COMMUNITY

During fiscal year 1971, the Defense Documentation Center (DDC) marked its 25th anniversary of service to the Federal scientific and technical community. The Center, as it is known today, evolved from an effort established in London, England, in July 1945. This effort involved the processing of tons of confiscated German documents for addition to the mass of domestic research and development reports generated in World War II. Since that time, the Center has operated under various organizational names at several locations. It is currently a major field activity of the Defense Supply Agency and is located at Cameron Station, Alexandria, Virginia. From its inception, DDC has been a common service organization with its information available to all of the military services.

Over the past several years, our Nation's monumental research and development efforts have resulted in a mounting accumulation of data in many forms. This accumulation, coupled with rapid accelerations in information technology and the ever-changing needs of information users, brought on an increasing problem of identifying and retrieving desired data for specific purposes from the scientific and technical stockpile. The mass of information itself is of little use to the researcher interested in a specific subject area. However, quick retrieval of appropriate data and timely presentation of this information in a useable form can save needless duplication of effort and expenditure of funds in other research and development projects. It is this principle of providing appropriate and timely information which lies at the heart of all DDC activity.

Within this environment, the role of the Center in the Defense Scientific and Technical Information Program has expanded significantly from its original mission of providing secondary distribution of research and development reports. Today, DDC furnishes a varied and coordinated mix of scientific, technical, and management information services and products tailored to the needs of activities and individuals with responsibilities or interests in the program. This mix may include full-size or microform copies of reports, other products in microform, information on magnetic tape, bibliographies in selected subject areas, specialized announcements, summaries of on-going research projects, tailored extracts from a variety of management information data banks, results of DDC development efforts, technological advances in information transfer and use, referral to other information sources, and many other services.

The basic purpose of the information furnished by the Center is to inform the user of the nature and findings of completed and on-going research and development work, and to give him some insight regarding work planned by others. With this information, the

user is better able to pursue his own projects by building on the documented base of the work of others.

The Center's programs for supporting the Federal scientific and technical community were well established during fiscal year 1971. However, to remain in the forefront of the information gathering and disseminating business, DDC continually strives to improve present methods and find still better ways to serve the community. Through developmental experiments, the Center is able to enhance its methods, services, and products. A number of experiments were either continued or initiated during this year. Recently installed advanced computer hardware and software have permitted experimentation in areas previously unexplored.

II. HIGHLIGHTS OF DDC MISSION RESPONSIBILITIES

The Defense Documentation Center is the central collection and redistribution point for the Department of Defense for technical and management information covering completed and on-going research and development efforts. Operational control of DDC is exercised by the Director, Defense Supply Agency, with policy direction from the Director of Defense Research and Engineering.

Traditionally, the Center acquires, stores, announces, and makes available all types of research and development reports produced by U.S. military organizations and by their contractors. Organizations registered as DDC users may obtain copies of these reports in full-size paper copy or in microform.

Holding high priority within the mission area is the development and operation of a variety of central Department of Defense computer-based data banks of technical and management information. The basic and most important of these is the data bank for the Department of Defense Research and Technology Work Unit Information System. This system is designed to collect specific elements of data on Defense-sponsored research and development efforts currently in progress; organize the data for computer storage; and provide reports on the types of work in progress, the current status of the efforts, costs, and other important information tailored to the users' needs. Other specialized data banks are maintained to satisfy specific requirements of the Department of Defense and to provide information in support of interagency projects.

Planning and executing the Development Program is the other major mission responsibility. This program is directed toward improving present systems; developing and installing new products, services, and integrated systems; determining and fulfilling user requirements; and promoting the scientific and technical information transfer process. The basic purpose of the program is to make technical and management information more accessible, timely, and relevant to the user community as an aid for insuring a military capability commensurate with our national policies. Using in-house expertise, or with contractor support, the Center conceives, conducts research on, tests, and evaluates information handling systems which have a potential for enhancing the effectiveness and efficiency of these efforts.

In accomplishing its mission, DDC collaborates with the Department of Defense and other Federal agencies to promote more effective interchange of information. Representatives of the military departments and other interested activities provide coordinated assistance to the Center on joint policies, procedures, and problems.

Products and services provided by DDC are available to components of the Department of Defense and other Federal Government agencies, and to their contractors, subcontractors, potential contractors, and grantees. Complete descriptions of these products and services, and procedures for registering to obtain them, are available from the Administrator, Defense Documentation Center, ATTN: DDC-L, Cameron Station, Alexandria, Virginia 22314.

While the Center does not serve the public directly, every effort is made to provide access to all reports which have no security or other distribution restrictions. Such reports are furnished to the National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22151. This organization announces and makes them available for sale to the general public along with similar documents from other sources.

III. TECHNICAL REPORT SERVICES

Document Collection

In order to give Defense researchers and related groups the recorded results of research completed by others, DDC maintains and continuously announces additions to a very large collection of technical reports. During fiscal year 1971, the Center accessioned the one millionth document into this collection. These reports include Department of Defense and other Government agencies' in-house laboratory reports, those generated by their contractors, foreign scientific and technical reports acquired under agreements with allied nations, and reports emanating from independent research programs and donated to the Department of Defense system. Although the document collection is heavily oriented toward military research and technology, there are large holdings in such diverse areas as biological and medical sciences, ecology, physics, various engineering fields, computer technology, group dynamics, and most other areas of science and technology. Over 40,000 new documents are added to the collection each year.

About two-thirds of the reports--those accessioned since 1953--are under computer control for quick retrieval. Descriptive summaries of the documents are manipulated by computer programs to produce user reference tools including bibliographies and announcement media. Complete copies of the reports are disseminated as full-size paper copy, microfiche, or microfilm. In addition, the Center is experimenting with on-line remote terminal searching devices with visual display which permit direct querying of the computer files by the users.

Technical Report Input

A total of 43,251 new technical reports was added to the DDC collection during fiscal year 1971. Input consisted of 38,336 reports which were announced for availability and 4,915 which were not announced. Of the reports announced, 20,374 were classified or were unclassified but had distribution limitations. The remaining 17,962 were unclassified with no distribution limitations. Average processing time for the announced reports, from initial receipt to publication of the announcement bulletin, was 46 calendar days.

Two Department of Defense actions during the year had impact on technical report input. An Air Force proposal, evaluated by DDC in fiscal year 1970, resulted in a change to Department of Defense Instruction 5100.38, Defense Documentation Center for Scientific and Technical Information. This change reduced the number of copies of individual reports which are to be submitted by the Defense activities and contractors to DDC for processing. Department of Defense Directive 5200.20, Distribution Statements

on Technical Documents, reduced the number and changed the scope of distribution statements that can be assigned to Defense-sponsored reports, thereby making the documents more widely accessible.

Announcement Services

Two basic publications continued as the media for announcing the availability of new reports added to the DDC collection. Both are published twice a month and are accompanied by well organized indexes to the reports described. The indexes for each publication are cumulated quarterly and annually.

The Technical Abstract Bulletin, a Confidential bulletin published by DDC, announces classified reports and those which are unclassified but have had some limitation placed on their release. A comprehensive study completed by DDC in April 1971 produced findings that printing of the Bulletin in-house rather than at the Government Printing Office can be done at a considerable cost saving and will allow faster distribution to the users. Plans are progressing to begin in-house publication in early fiscal year 1972. Also, beginning with the 1 April 1971 issue, the security classification of indexes to the Bulletin was changed from Unclassified to Confidential to parallel the basic document. This move permits DDC to enrich the indexes by including additional retrieval terms representing specialized subject matter which is frequently sensitive. Confidential titles are also added for the users' benefit.

The Government Reports Announcements (formerly the U.S. Government Research and Development Reports) is published by the National Technical Information Service, Department of Commerce. Unclassified reports which have no distribution limitations are announced for DDC in this publication along with similar reports from other Federal agencies. The unclassified and unlimited Department of Defense reports become a part of the National Technical Information Service collection and are distributed by that activity to all requesters. Data regarding these reports are incorporated into the DDC data bank and are available to the Center for use in bibliographies and other services.

Both the Technical Abstract Bulletin and the Government Reports Announcements are furnished to DDC users free of charge based on their need, interest, and security clearance.

In the first quarter of fiscal year 1971, the Center announced an Automatic Magnetic Tape Dissemination service through which users are provided announcements of the newly accessioned documents on magnetic tape. The tapes are available twice monthly and contain the same announcements as those published in the Technical Abstract Bulletin plus those published for DDC in the Government Reports Announcements. The announcement information

is transferred from computer storage onto magnetic tape suitable for the user's automatic data processing equipment. This service, available on a subscription basis, permits the user to conduct his own automated searches for and dissemination of information to fulfill his unique requirements.

Bibliography Services

As a related function within the technical report program, DDC continued to provide a variety of bibliography services to user organizations. Through this service, the Center produces listings which describe technical reports in the collection related to a particular subject or combination of subjects of interest to the user.

Demand Bibliographies (a user's request in a specific subject area) remained at a high level. Over 23,000 were completed during the year.

Current Awareness Bibliographies satisfied recurring needs for new information on homogeneous subjects. This service represented periodic output during the year amounting to over 2,600 bibliographies to 28 user organizations.

Scheduled Bibliographies compiled many references concerning subjects of known or anticipated high interest. Over 100 were prepared by DDC, added to the document collection, and announced as available. Series were continued on such topics as Environmental Pollution, Civil Defense Systems, Radiation, and Management Engineering and Decision Making.

Technical Report Output

Demand requests (requests from users for specific reports) for 981,105 reports were filled, mostly with microfiche, during the year. An additional 506,544 microfiche copies were forwarded automatically either to approved Federal agencies or to participants in an Automatic Document Distribution program, a former experimental development program which became operational during the year. This brought the secondary distribution of technical reports to a total of 1,487,649. Hard copies accounted for 12 percent, microfilm for 4 percent, and microfiche for 84 percent of the total distribution.

In addition, the Center made primary distribution of 18,055 copies of foreign scientific and technical reports to authorized users in the United States.

Defense R&D of the 1960s

A compendium of all DDC scientific and technical reports (over 400,000) announced during the 1960s was made available for sale on 16mm. positive or negative roll film in December 1970. Entitled "Defense Research and Development of the 1960s," and comprising citations and six indexes, this data package provides the user full reference coverage of that ten-year segment of Defense research and development effort. The compendium is offered as a complete package of 106 reels or as any of four sections, each of which is self-contained and is a complete reference source for the category of reports represented during the period covered. Direct conversion of the data from computer memory to microfilm was accomplished by the Computer-Output-Microfilm process which combines computer storage and retrieval with high-speed photocomposition capabilities.

The compendium is accompanied by a technical document published by DDC entitled "16mm. Microfilm Viewing Equipment Guide" (AD 718 000). This directory describes 16mm. microfilm readers and reader-printers manufactured or distributed in the United States and was prepared to aid users in selecting equipment.

Subsequent to the microfilm compendium, DDC also made the Defense R&D of the 1960s available on magnetic tape. This service provided those organizations possessing an automated system capability an opportunity to acquire a large machineable data base for use in retrospective data searches at the local level.

As a follow-on to the Defense R&D of the 1960s, a similar data package covering technical reports accessioned during calendar year 1970 was prepared. The Center plans to continue this method of information dissemination in future years.

Microform and Magnetic Tape Media

In keeping with the trend of the past few years, more and more of DDC's traditional documentation products, and new ones developed, are made available on microform or magnetic tape. For example, technical report requests filled in microform copy increased from about 18 percent in fiscal year 1968 to around 80 percent in fiscal year 1971. Products furnished on magnetic tape include current as well as previous document announcement citations, some categories of bibliographies, and certain extracts regarding on-going research projects.

Agreement with the Department of Commerce

In order to avoid duplication of effort and achieve economy and effectiveness in information transfer, the Department of Defense and the Department of Commerce have continued a detailed

working agreement since 1964. Throughout fiscal year 1971, the Department of Commerce, through its National Technical Information Service (formerly the Clearinghouse for Federal Scientific and Technical Information), continued to announce, store, and distribute unclassified and unlimited Department of Defense reports acquired by DDC. During the year, the function of storing and distributing unclassified documents having "No Foreign" and "U.S. Government Only" distribution statements, previously accomplished by the National Technical Information Service, was assumed by DDC. Thus, the Center now handles all classified reports and those unclassified reports having controlled distribution, while the National Technical Information Service distributes unclassified and unlimited documents serving both the Department of Defense and the public.

The National Technical Information Service continued the former Clearinghouse role of collection agent for DDC service charges. In addition, DDC assisted the National Technical Information Service with modifications and changes to their announcement publications to make them compatible with the DDC Technical Abstract Bulletin, and to allow the journals to supplement one another.

IV. RESEARCH AND ENGINEERING MANAGEMENT INFORMATION SERVICES

R&T Work Unit Information System

The major base for most of the Center's management information services is the computerized data bank serving the Department of Defense Research and Technology Work Unit Information System. Through this system, DDC collects a variety of information regarding current Defense-sponsored (in-house and contractor) research and development work, manipulates the information for computer storage, and feeds it back to the Defense community in formats to satisfy specific needs. Feedback provides concise information in such areas as Defense sponsor of the research, subject coverage, and the persons who are doing or did the work.

Because of the potential of the Work Unit Information System for improving efficiency of Defense research and development management, the system continued to be assigned first priority for DDC manpower and equipment resources throughout fiscal year 1971. The system helps the research and development manager to identify on-going work in his scientific and technical areas of interest, coordinate programs with other Department of Defense components and other agencies to avoid duplication of effort, and determine whether specific areas of endeavor adequately reflect research and development policy guidance. The system enables the individual bench scientist or engineer to keep up-to-date regarding the approach and current status of efforts related to his own work, and informs him about other scientists and engineers who can be contacted for further technical information. Additionally, the system is used to satisfy requirements for reports such as those needed by the National Science Foundation and the Smithsonian Institution's Science Information Exchange, as well as a variety of special one-time compilations of information, including Congressional requests.

Efforts emphasized during fiscal year 1970 toward more efficient collection of source data and overall improvement of the system continued throughout fiscal year 1971. Some of the areas in which effort was concentrated are summarized as follows:

a. Input. The Center established and is monitoring a coordinated system to improve and maintain the currency and quality of the source data input. Through combined efforts of DDC, the Defense Supply Agency, and Defense components involved, significant progress has been made in achieving this goal. Progress is evidenced by the fact that the percentage of records in the data bank which were not current was reduced from slightly over 41 percent in October 1969 to less than five percent on 30 June 1971. Internally, the Center initiated new systems to streamline input processing, identify and obtain missing elements of data from the contributors, and make information from the summaries available

to users more quickly.

Although input is primarily from Defense activities and contractors, some input is now being received from non-Defense sources. In October 1970, the National Center for Health Services Research and Development of the Department of Health, Education, and Welfare became a non-Defense contributor.

Input during fiscal year 1971 consisted of 8,773 new records and 56,140 changes or updates to records previously submitted. At yearend, there was a total of 57,246 records in the DDC data bank.

b. Output. Improved input to the Work Unit Information System is naturally followed by higher quality output products. A variety of formats including standard or special reports and bibliographic listings are used to satisfy the unique needs of individual requesters. Recurring reports are available as part of an established low-cost automated program which provides periodic information on a timely basis. Access to the data bank is available through the DDC on-line system from remote terminals both within the Center for internal retrieval, and in user activities who have terminals installed. Additionally, programs have been developed to provide the user with magnetic tapes of complete work unit records or specific data elements from the records. The output is available to Defense components and other Federal agencies on a need-to-know basis. Selected elements of data are also available to the Government's contractors, universities, and nonprofit research organizations.

The Center published and maintains a handbook (DSAH-4185.2 - R&T Work Unit Information System Report Format Catalog) of formats used to display work unit data for U.S. Government users. To further enhance the quality of retrieval, DDC also published for its analysts a handbook describing procedures and giving illustrations for formulating search strategies.

During fiscal year 1971, a total of 10,115 output products was made from the Work Unit Information data bank.

c. Consolidation of Military Services' Data Banks. While the military services contribute heavily to and draw from the centralized Work Unit Information data bank at DDC, the Army, Navy, and Air Force have in the past maintained similar data banks of certain information necessary to satisfy internal Service requirements. In July 1970, a U.S. General Accounting Office survey report recommended that the Secretary of Defense determine what functions can be eliminated from the military service data banks and that he plan to eliminate those functions at an appropriate date

This recommendation and subsequent developments resulted in both the Army and Navy requesting DDC to accept the additional data elements which they maintained and to include them in the

centralized data bank at the Center. This was accomplished for the Navy and Navy requesters are now dependent upon DDC for all Work Unit Information retrieval products. DDC and the Army have also agreed on the unique Army data elements required to expand the DDC data bank to permit Army to rely totally upon the data bank for work unit output. A group of specific Army reports and formats was provided DDC as the basis for the Army output specifications. The Air Force currently maintains a data bank of a portion of its research and development efforts in order to satisfy internal Air Force requirements for such information. It includes additional data, or variations of data elements, not submitted to DDC.

At the close of fiscal year 1971, DDC and Army, Navy, and Air Force representatives were continuing efforts to determine additional Work Unit Information System functions, performed individually by each Service, that could be consolidated and performed through the Defense-wide operation at DDC.

Other Data Banks

As in prior years, the Work Unit Information System continued to grow and change during fiscal year 1971 to maintain the capability of satisfying current management information needs. Additional data banks and mission responsibilities have been initiated to serve as a part of, or in conjunction with, the basic system. Services which have satisfied the initial purpose intended have been eliminated or adjusted according to current guidance. Some of these efforts pursued during the year are:

a. Independent Research and Development. At the request of the Director of Defense Research and Engineering, DDC established a prototype Independent Research and Development data bank in October 1970. Data collected through this medium serves as a base for an information system regarding Defense-supported independent research and development by contractors. This data bank will greatly increase the exchange of Independent Research and Development information throughout the Government. Guidance was received on the criteria for the release and use of the data. An Independent Research and Development Data Bank Input Manual, prepared by DDC, was approved for publication.

b. Research and Development Program Planning. Also in October 1970, a Research and Development Program Planning data bank became operational. It contains descriptions of planned research and development projects and provides information to aid the Director of Defense Research and Engineering and other Defense managers in reviewing and making decisions regarding development programs. The information is available through remote terminals of the DDC on-line system, and in hard copy format to registered Department of Defense users.

c. Contractor Performance Evaluation and Contractor Cost Reduction. Requests for this information declined during the year and, at yearend, the Contractor Performance Evaluation program was under study by higher headquarters to determine its future. Guidance was received to discontinue the Contractor Cost Reduction data bank. This was a result of revised Department of Defense guidelines which urged contractors to continue cost reduction programs on a voluntary basis but discontinue formal recording of their efforts.

d. Special "203" File. In January 1971, the Center was instructed by the Director of Defense Research and Engineering to discontinue a special "203" file established in fiscal year 1970. It was a special purpose temporary file containing information on the military services' research programs which did not meet relevancy requirements of Section 203 of the Military Procurement Authorization Act.

Special Services and Products

In addition to the regular contributions to the research and development community for which DDC is widely known, other special and unique services were innovated during the past year or expanded from previous years. Some examples follow:

a. Telelecture. An experiment in information retrieval training and DDC public relations was accomplished when a "telelecture" was given by one of the physical science administrators from his office at the Center to a graduate seminar class at Kent State University, Kent, Ohio. The experiment indicated that the two-way lecture by telephone is a promising technique that could be used in similar educational situations where emphasis is on information storage and retrieval.

b. Patent Information. With increasing frequency, DDC is being called upon to furnish background information on research involved in patent litigation. DDC is one of the very few centers which can provide historical information about content, release dates, and dissemination of data about Department of Defense research.

c. President's Committee on Scientific and Technical Information. The Center often provides services and support to this Committee. A description of the data processing and retrieval system in DDC was submitted for public release as a part of a Committee report entitled "Federal Mechanized Systems for Description, Announcement, and Dissemination of Scientific and Technical Information and Data." The Center participated with the Management of Information Activities Panel of the Committee in addressing problems such as review of programming, planning, and budgeting systems for information operations and activities;

service charges for information system outputs; reporting of information costs; and preparation of a handbook on model policies for management of scientific and technical information services. Printing services have also been provided for publications of the Committee.

d. Referral Services. DDC maintains a data bank of information sources to which users are referred for specialized subject information beyond that available at the Center. These sources include information analysis centers, special libraries, data centers, laboratories, and test directorates. A directory of the complete data bank was published and made available to the public in November 1970. A revision entitled "Defense Documentation Center Referral Data Bank Directory" (AD 724 700) was being published at the close of the year. The revision contains over 200 Government-sponsored specialized data sources.

e. Central Registry. A central registry service is provided by DDC to register users for access to information disseminated not only by the Center but also by other Department of Defense information activities. A "Dissemination Authority List" is issued monthly to enable all the disseminating activities to verify the eligibility of requesting organizations. The List was revised and streamlined during the year to improve the format and to provide more information about the registrants.

f. Miscellaneous Requests. Many requests for highly specific information were received from various sources including the Office of the Secretary of Defense, the Congress, foreign embassies, and foreign Ministries of Defense.

V. DEVELOPMENT

Development Program

Development Program activity during fiscal year 1971 consisted of a continuation of previous efforts and the introduction of new information technology to improve the process of information transfer and use in Defense research programs. During the year, the Center experimented with techniques and equipment such as a remote on-line retrieval capability with access to multiple data bases, English language retrieval capability, machine-aided indexing, data management systems to provide a generalized on-line data management capability to remote terminal users, automated profiling techniques for automatic document distribution, and more sophisticated automatic data processing systems.

Development effort results were appropriately blended into operational functions and services to customers. This included interfacing added capabilities with other Government agency and industry technical information systems. The Center also contributed the results of its research and development experience to the body of technical information through publication of DDC-originated technical reports which were added to its document collection and made available to users.

On-Line Retrieval System Experiment

Remote on-line experimentation was extended to link seven remote keyboard-display terminals, including two within the Center, to the DDC computer. Much effort was put forth during the year to refine and improve the overall system both in its operation and in the equipment utilized. The system, originally designed to provide access to the Research and Technology Work Unit Information System data bank, now also provides access to the Technical Report data bank and some special purpose data banks. This information can be obtained through the system on an interactive basis allowing the user to probe, identify, and retrieve information directly without intermediary assistance.

The terminals were used extensively throughout the year for testing and further experimenting. Plans were initiated and the foundation established for the addition of more terminals and expansion of the scope of the information available through the system.

A technical report, "Development of the Defense Documentation Center Remote On-Line Retrieval System - Past, Present, and Future" (AD 720 900), describing the system was published in March 1971. This document highlights in nontechnical language the development of the system from its inception to what is planned. It describes in detail the current operating system,

equipment configuration and associated costs, user training, and system evaluation.

Selective Documentation Services

Two documentation services development projects initiated prior to fiscal year 1971 continued on into the year. Sufficient progress was made to allow conversion of the projects from experimental to fully operational systems within the overall DDC Technical Report Services program.

a. Automatic Magnetic Tape Dissemination. This service became operational in August 1970 on a subscription basis. It enables DDC users to receive on magnetic tape the same announcement information concerning newly accessioned documents as is published twice-monthly in hard copy announcement bulletins. During the fourth quarter of the year, the service was expanded to provide not only the current announcement information, but also that contained in prior announcement bulletins.

b. Automatic Document Distribution. Continued experimental work during most of the year led to operational implementation of the Automatic Document Distribution program in June 1971, and the service is now available to all large volume users who register for it. The program is designed to anticipate the user's needs by matching his predetermined subject area of interest profile against the computer data bank of newly accessioned documents. Then, microfiche copies of all the documents falling within his profile are automatically furnished to the user at approximately the same time the documents are announced. Experimentation with profiling techniques is continuing to further refine user profiles to more precisely identify subject areas of interest and thereby eliminate distribution of documents which may not be relevant.

Coordinated application of the magnetic tape announcement and automatic document distribution services enables local information activities to provide very responsive and highly effective documentation services for their users and for in-house functions.

A DDC technical report, "Automatic Selective Documentation Services" (AD 722 425), was published in March 1971 to provide the rationale, methodology, and results of the Center's experimentation with various forms of automatic selective documentation services.

Microphotography

A number of innovations were accomplished by the Center in its program to improve microphotographic capabilities and diversify services to the user. This, coupled with DDC-coordinated development efforts with users and manufacturers, resulted in new and

better products on microform and in user-oriented microform handling systems.

Design specifications for two low-cost microfiche storage and retrieval systems were made available by DDC through a contract study. A contractor prepared report, "Microfiche Storage and Retrieval System Study" (AD 710 000), described the two systems, each applicable to a specific user category. One is a cartridge system at a cost of around \$4,000 for bench-level type users with collections of under 10,000 microfiche documents. The other is a fully automated multiple output system modularly expandable for up to 30,000 microfiche with the cost of the basic system estimated to be under \$20,000.

Extensive experiments with the Computer-Output-Microfilm process confirmed the significant benefit potential possible. The process involves transfer of digital information directly from computer tape to film thereby achieving computer speed through photographing rather than impact printing of the data. Several applications of the Computer-Output-Microfilm process were developed, tested, and placed in a pilot production environment. The greatest of these efforts was the production of the Defense R&D of the 1960s compendium.

A very comprehensive and current study of the Center's microphotography system is detailed in the document, "Micrographics at DDC" (AD 722 950), published in May 1971. This report describes the technical aspects of production and the equipment that makes those techniques unique in the processing of microform products. Descriptions are given of various equipment modifications and, in some cases, new and unique roles for such equipment.

Language and Indexing Systems

A progress report, "Machine-Aided Indexing" (AD 721 875), was published to record development progress of the prototype Machine-Aided Indexing System during fiscal year 1970. Significant progress continued throughout fiscal year 1971. The system is designed to provide for computer indexing of text material. An output by-product identifies errors (grammatically incorrect index terms), and produces new index terms for use in updating the system. Resumes that comprise the Research and Development Program Planning data bank, created at DDC during the year, were indexed by the system. Additionally, the Lunar Receiving Laboratory, Houston Space Flight Center, used a version of the DDC Machine-Aided Indexing logic to fulfill its indexing needs. Further development and application efforts will continue into fiscal year 1972.

A Natural English Preprocessor system was under development through contractual efforts. The ultimate objective of the system is to permit a user without formal training in computer technology

or retrieval techniques to interact with the DDC computer data banks from remote on-line terminals, using natural language familiar to him rather than artificial vocabulary. The contractor demonstrated the system in late fiscal year 1971 and a test of the system was completed by DDC personnel. Completion of the contractual project is expected in early fiscal year 1972.

In association with the Preprocessor system, in-house development progressed to provide an English language data base of technical terminology. The data base serves as an interface between the natural language of the user and the constraints inherent in computer usage. Interfaces between the data base and index terms generated by machine-aided indexing have been developed and tested.

Automatic Data Processing Developments

Concentrated efforts in fiscal year 1970 to attain full operational status of a newly purchased UNIVAC 1108 computer system resulted in a sound third generation computer base for both operational and experimental programs during fiscal year 1971. Major emphasis during this report period was placed on further refinement of the system and its adaptation to continuing and new mission responsibilities.

Older terminal equipment in the on-line hookup to the DDC computer was replaced with newer and better terminals which provide faster data retrieval at less cost. Additional remote terminal equipment, on loan from the manufacturer, was tested to determine its compatibility with existing hardware and software utilized in the on-line retrieval system and the DDC system for computer input processing by remote terminals.

In coordination with the computer manufacturer, DDC experimented with a simulation package known as the System and Computer Evaluation and Revision Technique. The package was used to evaluate the performance of the current UNIVAC 1108 computer configuration at DDC, and offered a tool to define actual operational conditions and desired improvements. It also provided valuable guidance in determining and planning for core memory requirements of the future.

These and similar accomplishments, coupled with refinements in the EXEC VIII 1108 Operating System, gave the Center an enviable automatic data processing capability for its developmental and operational missions.

Future Development Plans

During the year, the Center initiated planning for new development projects, or variations of current projects, to be pursued

in fiscal year 1972 and beyond. The following efforts are included:

Extend on-line access within DDC to other data banks to improve retrieval capability.

Extend on-line access to DDC data banks to Defense laboratories and other Federal agencies.

Develop an integrated approach to on-line data retrieval to permit interrogation of multiple data bases with one search pattern.

Develop a data bank reflecting comprehensive in-depth knowledge of the characteristics of DDC users/contributors to serve as a base for development planning to direct the output of products and services, and to provide data on which to base management decisions.

VI. CUSTOMER RELATIONS

An aggressive Customer Relations Program continued efforts to ensure that programs and services offered by DDC are made known to Federal agencies, industrial and educational institutions, and similar interested activities and individuals. Improvements were made in communications media used in the past and new media were introduced to further enhance relations between the Center and its public. Emphasis was placed on stressing the value of the DDC compendium, "Defense R&D of the 1960s," and on the advantages of ordering technical reports in microfiche form.

The Center's Customer Relations Program comprises two major areas: a field liaison activity and a liaison coordination activity, plus related public affairs and corollary functions.

Field liaison officers, including one representative from each of the three military services, briefed users and potential users concerning DDC services and products, registration requirements, the use of pertinent forms and publications, and the relevant Department of Defense regulations. General briefings, classroom lectures, symposia, procurement conferences, and other means of direct contact were utilized.

Regional customer community groups, sponsored by user organizations, were actively encouraged by DDC as a forum for exchanging ideas and discussing information transfer problems. More than 50 such groups, called Regional User Groups, have been established and DDC field liaison personnel have participated in many of the regional meetings. In addition, space was offered in the DDC Digest for the exchange of ideas among groups.

Through efforts of DDC's Navy liaison officer, U.S. Coast Guard activities were granted authorization to order documents on a basis similar to that of Department of Defense activities.

The liaison coordination activity provided support to the field liaison efforts and performed the Center's public affairs function. Plans and materials were developed or revised to implement customer orientation and educational programs. User reactions, both complimentary and adverse, concerning the Center's programs and services were studied. Recommendations were developed to satisfy complaints and alleviate problem areas. A question and answer review of DDC programs and services was published for in-house use in responding to questions from the user community.

A new color-sound motion picture describing DDC programs and services went into production. Scenes for most of the film were photographed at the Center during February and March 1971. Prints of the new film are scheduled to be available early in fiscal year 1972.

Other liaison support accomplishments included periodic distribution of the DDC Digest (a publication which conveys current information concerning the Center's products and services), completion of a major DDC exhibit for use by field liaison personnel and for other appropriate uses, and the preparation of articles and news items about the Center for publication in technical journals.

In addition to other Customer Relations activities, the Center was host throughout the year to many visitors, both foreign and domestic. Many of them were seeking information about DDC programs, systems, and procedures for possible application in their own organizations. Also, in the interest of scientific and technical information exchange among governments, the Center maintained close liaison with embassies of many foreign countries.

VII. MANAGEMENT AND SUPPORT

Organization

There was no major reorganization of DDC during the year. Changes within the organizational structure were accomplished to further refine the organization and to establish an optimum environment for improving programming techniques and for undertaking greater workloads.

Financial

As of the end of fiscal year 1971, DDC had net obligations of \$10,514,000 in the following Object Classes:

| | |
|--|--------------|
| Personal Services and Benefits..... | \$ 7,598,000 |
| Travel..... | 52,000 |
| Transportation of Things..... | - |
| Rentals, Communications..... | 517,000 |
| Printing (GPO)..... | 229,000 |
| Other Services (including NTIS support)..... | 1,537,000 |
| Supplies..... | 298,000 |
| Equipment (including major ADPE)..... | 283,000 |
| TOTAL | \$10,514,000 |

A goal of \$235,000 in fiscal year 1971 was established for DDC under the Department of Defense Cost Reduction Program. Claims approved totalled \$151,223. The major portion of these reductions was achieved through improved methods of reproducing hard copy documents and by purchasing, rather than renting, automatic data processing equipment.

To support the Center's fiscal year 1972 budget request, a comprehensive fact book about DDC operations was completed in April 1971 for use by Defense Supply Agency representatives in budget hearings before Congressional committees.

DDC Service Charge

Following Department of Defense guidance, a service charge of \$3 per copy for full-size paper documents which are also available on microfiche has continued since 1 July 1968. During fiscal year 1971, an expansion of the service charge concept was announced to include a charge for the following new products and services:

- Technical Reports Announcement Media on Magnetic Tape
- Defense R&D of the 1960s on Microfilm
- Defense R&D of the 1960s on Magnetic Tape
- Defense R&D of 1970 on Microfilm
- Retrospective Technical Report Search Information on Magnetic Tape.

Beginning with fiscal year 1972, the service charge will be further extended to include the \$3 per copy charge for all full-size paper documents and a service charge for documents on microfilm and microfiche.

The National Technical Information Service will continue to serve as collection agent for all DDC service charges.

Manpower

The Center began fiscal year 1971 with an authorization of 562 civilian employees. In January 1971, the fiscal yearend authorization was reduced from 556 to 533. A freeze on hiring was in effect during the last half of the year. Actual civilian strength was reduced from 552 at the beginning of the year to 527 at yearend. The military personnel authorization was reduced from 4 to 3 on 1 July 1970 with the abolishment of the Executive Officer position. Military personnel assigned consisted of one liaison officer each for the Army, Navy, and Air Force.

Two Presidential employment programs were supported during the year. Six youths were employed for the summer of 1971 under the Summer Employment of Disadvantaged Youths Program. Participation in the Veterans' Readjustment Appointments Program consisted of training five Vietnam era veterans in the data processing field to aid them in their return to civilian life.

Performance Measurement

The computer-based DDC Manpower Performance Reporting System underwent major revisions and was streamlined to eliminate reporting not essential to management evaluation and control; provide compatibility with the revised Research, Development, Test, and Evaluation Project-Subproject structure used for budgeting and five-year planning; encompass new or changing mission responsibilities; and establish a consistent base for manpower reporting to higher authority.

Emergency Plans

Four changes to the DDC Field Activity War and Emergency Support Plan were published during the year. The changes included revisions in annex format, content, and coverage; and provided additional plans and procedures in the event of bomb threats and during periods of anticipated or actual disruption of postal services. The Plan was tested during planning and execution phases of Exercise HIGH HEELS for calendar year 1971 and during periodic exercises conducted under the Defense Supply Agency War and Emergency Support Plan Exercise Program.

Miscellaneous Events and Actions

In January 1971, the Defense Supply Agency Director's Safety Trophy was presented to DDC for its completion of over one million man-hours during calendar year 1970 without a lost-time injury.

An affirmative action plan for executing the Equal Employment Opportunity Program within DDC was published in August 1970.

Of seventy suggestions submitted under the Beneficial Suggestion Program, twenty-one were adopted and placed into effect.